C-A OPERATIONS PROCEDURES MANUAL

4.96.2 Critical Device Subsystem Response Checklist For Peers 3, 23 and 25 in Building 921, 912, 911 and H10 House

Text Pages 1 through 23

Hand Processed Changes

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Approved by: _____ _____
AGS Department Chairman Date

A. McGeary

4.96.2 CRITICAL DEVICE SUBSYSTEM RESPONSE CHECKLIST FOR PEERS 3, 23 AND 25 IN BUILDING 921, 912, 911 AND H10 HOUSE

1. Purpose and Scope

Specifies the procedure to be employed during periodic validation of the PASS Access Control System Mode Responses.

2. Responsibilities

2.1 The AGS or RHIC Safety Systems Group Leader shall ensure that this procedure is executed, at no greater than six month intervals, or at such times as required by the RSC.

2.2 The AGS or RHIC Safety Systems Group Leader shall review and initial the completed procedure checklist.

2.3 The AGS or RHIC RSC Chairman (or his designee) shall review the test results.

2.4 Members of the AGS or RHIC Safety Systems Group shall, as designated, conduct and document this procedure.

2.5 The software engineers shall ensure the configuration control of the software tested.

3. Prerequisites

3.1 This procedure shall only be exercised after successful completion of Uup, Udn, VT, V1 and MUON Gate, Crash and Chipmunk test procedures.

3.2 This procedure may only be executed by members of the AGS or RHIC Safety System group whose training is shown as “valid” in the a Department or Project Training Database.

3.3 Three trained individuals are required to perform this procedure. One team member (Signal verifier) will work from the Control Room; the second (Inspector 1) and third (Inspector 2) will work in the power supply houses.

3.4 The critical devices UD1,2 P.S., UD1,2 440V DISCONNECT, H10 Extraction P.S., V1D1, V1D2 P.S.'s, BF6 and DH2,3 P.S.'s must be ready for energization at the appropriate step of this procedure.

3.5 Prior to execution of this procedure, the BTA beam line shall be placed in a safe off condition by performing "Lockout/Tagout for Radiation Safety (RS LOTO)" (AGS OPM 9.1.16).

RS LOTO of BTA performed _____.

3.6 Programs loaded Divisions A & B for Peers 3, 23, & 25; and recorded in PASS Engineering Change LogBook.

3.7 Run switches Peers 3, 23, & 25 RSC Red Tagged and Taped by AGS Safety Systems Group Leader Engineers.
RS LOTO Applied Div A:
Peer 3 _____.
Peer 23 _____.
Peer 25 _____.
RS LOTO Applied Div B:
Peer 3 _____.
Peer 23 _____.
Peer 25 _____.
RS LOTO Development System Access Connector A Tag #_____
RS LOTO Development System Access Connector B Tag #_____

3.8 Notify the Operations Coordinator (OC) or the Main Control Room (MCR) supervisor that the critical devices are being tested.

4. Precautions

None

5. Procedure

5.1 From PASS Engineering Change Log Book, record software installed Peers 3, 23 & 25, both Divisions A & B.
Division A Compiler version _____
Division B Compiler version _____
Peer 3 Div A Program Version: _____
Save Date _____
Peer 3 Div B Program Version: _____
Save Date _____
Peer 23 Div A Program Version: _____
Save Date _____
Peer 23 Div B Program Version: _____
Save Date _____
Peer 25 Div A Program Version: _____
Save Date _____

Peer 25 Div B Program Version: _____
Save Date _____

NOTE:
Mode selection is accomplished by Panelview.

NOTE:
Observation of critical devices is observed both on Panelview and at location of the critical device

PEER 3 CRITICAL DEVICES - V1D1 PS, V1D2 PS, AGS ENABLE (P), AGS ENABLE (R)

5.2 V1D1 PS and V1D2 PS Critical Devices (Drawing C1028023)

5.2.1 Confirm that the Critical Devices V1D1 PS and V1D2 PS are labeled with orange security interlock signs, that the interconnects between the Critical Devices and the Building 921 Critical device Box(5470) is undamaged as are the RIO feeds from the PLC's.

Orange tags present _____
Mechanical inspection OK _____

5.2.2 With Peer3A and 3B in NO ACCESS (mode 24) observe that after 90 seconds that Critical Devices V1D1 PS and V1D2 PS are enabled. The RED "Security Interlock OK" lamp on the P.S.'s are on.

V1D1 PS enabled by PASS _____
V1D2 PS enabled by PASS _____
RED lamp on V1D1 PS is on _____
RED lamp on V1D2 PS is on _____
V1D1 Indicates off Div A: Peer 3A in7 on _____
V1D1 Indicates off Div B: Peer 3B in7 on _____
V1D2 Indicates off Div A: Peer 3A in6 on _____
V1D2 Indicates off Div B: Peer 3B in6 on _____

5.2.2.1 Confirm that the V1D1 and V1D2 PS's can be turned on. V1D1 PS turned on _____
V1D2 PS turned on _____
V1D1 Indicates on Div A: Peer 3A in7 off _____
V1D1 Indicates on Div B: Peer 3B in7 off_____

V1D2 Indicates on Div A: Peer 3A in6 off _____
V1D2 Indicates on Div B: Peer 3B in6 off _____

Note:
Relay K17, Terminal 5 is shown in this procedure as K17/5. Terminal 22 on the Main Strip is shown as 5470A/22

5.2.2.2 Both Divisions are necessary for V1D1 & V1D2 on:
With Power Supplies on;
Measure resistance K16/5 to 5470A/25.
Less than 2 ohms _____
Measure resistance K16/5 to 5470A/23.
Less than 2 ohms _____
Measure resistance K18/5 5470A/29.
Less than 2 ohms _____
Measure resistance K18/5 to 5470A/27.
Less than 2 ohms _____

5.2.2.3 Both Divisions assure V1D1 & V1D2 off:
Set Peer 3A and 3B to C/A (mode 16) and observe V1D1 PS and V1D2 PS trip off.
V1D1& V1D2 PS trip off _____
V1D1 Red light off and PS will not come on._____
V1D2 Red light off and PS will not come on._____
Measure resistance K17/5 5470A/25.
Greater than 100K ohms _____
Measure resistance K17/5 5470A/23.
Greater than 100K ohms _____
Measure resistance K18/5 to 5470A/29.
Greater than 100K ohms _____
Measure resistance K18/5 to 5470A/27.
Greater than 100K ohms _____

5.2.2.4 Set Peer 3A and 3B to R/A (mode 8) and observe V1D1 PS and V1D2 PS lamps.
V1D1 Red light off and PS will not come on._____
V1D2 Red light off and PS will not come on._____

5.2.2.5 Set Peer 3A and 3B to Safe State (mode 2) and observe V1D1 PS and V1D2 PS lamps.
V1D1 Red light off and PS will not come on._____
V1D2 Red light off and PS will not come on._____

5.2.2.6 Check readbacks respond for V1D1.
Lift Term strip 5470A wire #23.
Panel View indicates V1D1 on _____
V1D1 Indicates on Div A: Peer 3A in7 off _____
V1D1 Indicates on Div B: Peer 3B in7 off _____

5.2.2.7 Check readbacks respond for V1D2.
Lift Term strip 5470A wire #27.
Panel View indicates V1D2 on _____
V1D2 Indicates on Div A: Peer 3A in6 off _____
V1D2 Indicates on Div B: Peer 3B in6 off _____

5.3 V1D1 PS and V1D2 PS Critical Device Reachback to AGS
The following test will be done with peer23 in No Access, beam enabled state and peer 25 in Safe State, no reachback.

5.3.1 Confirm that the Building 921 Critical device Box (5470) is mechanically sound and that the interconnects between this enclosure and the Security system junction box 5133 is undamaged as are the RIO feeds from the PLC's. The GREEN communication (COM) lamps on the RIO blocks should be ON.

Mechanical inspection OK _____
Peer 3A and 3B COM lamps on _____

5.3.2 With Peer3A and 3B in SAFE STATE (mode2) for 2 minutes, confirm that Critical Devices are energized and Panelview indication.

Measure resistance 5470A/13 to K2/5 Less than 2 ohms _____
Measure resistance 5470A/15 to K2/5 Less than 2 ohms _____
Measure resistance 5470A/14 to K8/5 Less than 2 ohms _____
Measure resistance 5470A/16 to K8/5 Less than 2 ohms _____

Panelview indicates AGS ENABLED by Peer 3 _____

5.3.3 With Peer3A and 3B in R/A (mode8) for 2 minutes, confirm that Critical Devices are enabled
Panelview indicates AGS ENABLED by Peer 3 _____

5.3.4 With Peer3A and 3B in C/A (mode16) for 2 minutes, confirm that Critical Devices are enabled.
Panelview indicates AGS ENABLED by Peer 3 _____

5.3.5 With Peer3A and 3B in NO ACCESS (mode24) for 2 minutes, confirm that Critical Devices are enabled.
Panelview indicates AGS ENABLED by Peer 3 _____

5.4 Test that incorrect status of V1D1 and V1D2 reaches back to interlock AGS Injection path 1 & 2.
(Drawing D36-E237)

5.4.1 With Peer3A and 3B in SAFE STATE (mode2) for 2 minutes, confirm that Critical Reachback Devices are enabled. Confirm that Output lamps O4 and O5 are on for both Division "A" and "B" RIO blocks.

Division "A" O4 is on _____ O5 is on _____
Division "B" O4 is on _____ O5 is on _____

5.4.1.1 Lift wire 5470A/24
Peer3A O4 and O5 go from on to off _____
Peer3B O4 and O5 go from on to off _____
Panelview shows AGS DISABLED by Peer 3 _____
Measure resistance 5470A/13 to K2/5
Greater than 100K ohms _____
Measure resistance 5470A/15 to K2/5
Greater than 100K ohms _____
Measure resistance 5470A/14 to K8/5
Greater than 100K ohms _____
Measure resistance 5470A/16 to K8/5
Greater than 100K ohms _____

Reconnect 5470A/24 and reset reach back via Panelview and restore mode.

5.4.1.2 Lift wire 5470A/28
Peer3A O4 and O5 go from on to off _____
Peer3B O4 and O5 go from on to off _____
Panelview shows AGS DISABLED by Peer 3 _____
Measure resistance 5470A/13 to K2/5
Greater than 100K ohms _____
Measure resistance 5470A/15 to K2/5
Greater than 100K ohms _____
Measure resistance 5470A/14 to K8/5
Greater than 100K ohms _____
Measure resistance 5470A/16 to K8/5
Greater than 100K ohms _____

Reconnect 5470A/28 and reset reach back via Panelview and restore mode.

5.4.2 With Peer3A and 3B in R/A (mode8) for 2 minutes, confirm that Critical Devices BF6 and DH2,3 are enabled. Confirm that Output lamps O4 and O5 are on for both Division "A" and "B" RIO blocks.

Division "A" O4 is on _____ O5 is on _____
Division "B" O4 is on _____ O5 is on _____

5.4.2.1 Lift wire 5470A/24
Peer3A O4 and O5 go from on to off _____
Peer3B O4 and O5 go from on to off _____
Panelview shows AGS DISABLED by Peer 3 _____

Reconnect 5470A/24 and reset reach back via Panelview and restore mode.

5.4.2.2 Lift wire 5470A/28
Peer3A O4 and O5 go from on to off _____
Peer3B O4 and O5 go from on to off _____
Panelview shows AGS DISABLED by Peer 3 _____

Reconnect 5470A/28 and reset reach back via Panelview and restore mode.

5.4.3 With Peer3A and 3B in C/A (mode16) for 2 minutes, confirm that Critical Devices BF6 and DH2,3 are enabled. Confirm that Output lamps O4 and O5 are on for both Division "A" and "B" RIO blocks.

Division "A" O4 is on _____ O5 is on _____
Division "B" O4 is on _____ O5 is on _____
Panelview indicates AGS DISABLED by Peer 3 _____

5.4.3.1 Lift wire 5470A/24
Peer3A O4 and O5 go from on to off _____
Peer3B O4 and O5 go from on to off _____
Panelview shows AGS DISABLED by Peer 3 _____

Reconnect 5470A/24 and reset reach back via Panelview and restore mode.

5.4.3.2 Lift wire 5470A/28
Peer3A O4 and O5 go from on to off _____
Peer3B O4 and O5 go from on to off _____
Panelview shows AGS DISABLED by Peer 3 _____

Reconnect 5470A/28 and reset reach back via Panelview and restore mode.

PEER 23 CRITICAL DEVICES - AGS INJECTION ENABLE (1), AGS INJECTION ENABLE (2), BOOSTER INJECTION ENABLE (1), BOOSTER INJECTION ENABLE (2)

5.5 AGS INJECTION ENABLE (1), AGS INJECTION ENABLE (2),
The following test will be done with Peer 3 and Peer 25 in SAFE STATE (no reach back to AGS Injection Enable)

5.5.1 With Peer 23A and 23B in NO ACCESS (mode 24) observe that after 90 seconds that AGS INJECTION ENABLE (1) and AGS INJECTION ENABLE (2) are enabled and Panelview so indicates.

Measure resistance 5470A/13 to K4/5 Less than 2 ohms _____
Measure resistance 5470A/15 to K4/5 Less than 2 ohms _____
Measure resistance 5470A/14 to K10/5 Less than 2 ohms _____
Measure resistance 5470A/16 to K10/5 Less than 2 ohms _____

AGS INJECTION ENABLE (1) indicates : Peer 23A out7 on _____
AGS INJECTION ENABLE (2) indicates : Peer 23A out6 on _____
AGS INJECTION ENABLE (1) indicates : Peer 23B out7 on _____
AGS INJECTION ENABLE (2) indicates : Peer 23B out6 on_____

AGS INJECTION STATUS (1) indicates: Peer 23A in7 on _____
AGS INJECTION STATUS (2) indicates: Peer 23A in6 on _____
AGS INJECTION STATUS (1) indicates: Peer 23B in7 on _____
AGS INJECTION STATUS (2) indicates: Peer 23B in6 on _____

Panelview indicates AGS INJECTION (1) and (2) enabled
by Peer 23 _____

5.5.2 Confirm that AGS INJECTION can be enabled

AGS INJECTION STATUS (1) indicates: Peer 23A in7 off _____
AGS INJECTION STATUS (2) indicates: Peer 23A in6 off _____
AGS INJECTION STATUS (1) indicates: Peer 23B in7 off _____
AGS INJECTION STATUS (2) indicates: Peer 23B in6 off _____

5.5.3 Both divisions assure AGS INJECTION disabled for C/A
Set Peer 23A and 23B to C/A (mode 16) and observe AGS Disabled.

Measure resistance 5470A/13 to K4/5
Greater than 100k ohms _____
Measure resistance 5470A/15 to K4/5
Greater than 100k ohms _____
Measure resistance 5470A/14 to K10/5
Greater than 100k ohms _____
Measure resistance 5470A/16 to K10/5
Greater than 100k ohms _____

AGS INJECTION ENABLE (1) indicates : Peer 23A out7 off _____
AGS INJECTION ENABLE (2) indicates : Peer 23A out6 off _____
AGS INJECTION ENABLE (1) indicates : Peer 23B out7 off _____
AGS INJECTION ENABLE (2) indicates : Peer 23B out6 off _____

AGS INJECTION STATUS (1) indicates: Peer 23A in7 on _____
AGS INJECTION STATUS (2) indicates: Peer 23A in6 on _____
AGS INJECTION STATUS (1) indicates: Peer 23B in7 on _____
AGS INJECTION STATUS (2) indicates: Peer 23B in6 on _____

5.5.4 Both divisions assure AGS INJECTION disabled for R/A
Set Peer 23A and 23B to R/A (mode 8) and observe AGS Disabled.

AGS INJECTION ENABLE (1) indicates : Peer 23A out7 off _____
AGS INJECTION ENABLE (2) indicates : Peer 23A out6 off _____
AGS INJECTION ENABLE (1) indicates : Peer 23B out7 off _____
AGS INJECTION ENABLE (2) indicates : Peer 23B out6 off _____

AGS INJECTION STATUS (1) indicates: Peer 23A in7 on _____
AGS INJECTION STATUS (2) indicates: Peer 23A in6 on _____
AGS INJECTION STATUS (1) indicates: Peer 23B in7 on _____
AGS INJECTION STATUS (2) indicates: Peer 23B in6 on _____

5.5.5 Both divisions assure AGS INJECTION disabled for SAFE STATE
Set Peer 23A and 23B to SAFE STATE (mode 2) and observe AGS Disabled.

AGS INJECTION ENABLE (1) indicates : Peer 23A out7 off _____
AGS INJECTION ENABLE (2) indicates : Peer 23A out6 off _____

AGS INJECTION ENABLE (1) indicates : Peer 23B out7 off _____
AGS INJECTION ENABLE (2) indicates : Peer 23B out6 off _____

AGS INJECTION STATUS (1) indicates: Peer 23A in7 on _____
AGS INJECTION STATUS (2) indicates: Peer 23A in6 on _____
AGS INJECTION STATUS (1) indicates: Peer 23B in7 on _____
AGS INJECTION STATUS (2) indicates: Peer 23B in6 on _____

5.6 BOOSTER INJECTION ENABLE (1) and BOOSTER INJECTION ENABLE (2)

5.6.1 Confirm that the Building 911 upper terminal room Critical Device box is mechanically sound and that the GREEN communication (COM) lamps on the RIO blocks are ON.

5.6.2 With Peer23A and 23B in SAFE STATE (mode 2) for 2 minutes, confirm that BOOSTER INJECTION ENABLE (1) and BOOSTER INJECTION ENABLE (2) and Panelview so indicates.

Measure resistance terminal 2-4 to 2K2/1 Less than 2 ohms _____
Measure resistance terminal 2-5 to 2K1/3 Less than 2 ohms _____
Measure resistance terminal 1-4 to 1K2/1 Less than 2 ohms _____
Measure resistance terminal 1-5 to 1K1/3 Less than 2 ohms _____

BOOSTER INJECTION ENABLE (1) indicates:
Peer 23A out7 on _____
BOOSTER INJECTION ENABLE (2) indicates:
Peer 23A out6 on _____
BOOSTER INJECTION ENABLE (1) indicates:
Peer 23B out7 on _____
BOOSTER INJECTION ENABLE (2) indicates:
Peer 23B out6 on_____

Assuming Booster Injection is On:

BOOSTER INJECTION STATUS (1) indicates:
Peer 23A in7 off _____
BOOSTER INJECTION STATUS (2) indicates:
Peer 23A in6 off _____
BOOSTER INJECTION STATUS (1) indicates:
Peer 23B in7 off _____
BOOSTER INJECTION STATUS (2) indicates:
Peer 23B in6 off _____

Panelview indicates Booster Injection enabled by Peer 23 _____

5.6.3 With Peer23A and 23B in R/A (mode 8) for 2 minutes confirm that Booster Injection is enabled.

BOOSTER INJECTION ENABLE (1) indicates:
Peer 23A out7 on _____
BOOSTER INJECTION ENABLE (2) indicates:
Peer 23A out6 on _____
BOOSTER INJECTION ENABLE (1) indicates:
Peer 23B out7 on _____
BOOSTER INJECTION ENABLE (2) indicates:
Peer 23B out6 on_____

Panelview indicates Booster Injection enabled by Peer 23 _____

5.6.4 With Peer23A and 23B in C/A (mode 16) for 2 minutes confirm that Booster Injection is enabled.

BOOSTER INJECTION ENABLE (1) indicates:
Peer 23A out7 on _____
BOOSTER INJECTION ENABLE (2) indicates:
Peer 23A out6 on _____
BOOSTER INJECTION ENABLE (1) indicates:
Peer 23B out7 on _____
BOOSTER INJECTION ENABLE (2) indicates:
Peer 23B out6 on_____

Panelview indicates Booster Injection enabled by Peer 23 _____

5.7 Test that incorrect status of AGS Injection reaches back to interlock Booster Injection path 1 and 2.

5.7.1 With Peer23A and 23B in SAFE STATE (mode 2) for 2 minutes, confirm that Booster Injection (1) AND BOOSTER Injection (2) are enabled. Confirm that at Booster Injection Critical Device Box in Building 911 Output lamps O6 and O7 are ON for both Division “A” and “B”.

5.7.1.1 In Building 921 lift wire 5470A17 to lose AGS Injection Off (1) status
At Peer 23 Critical Device Box in building 911:
Peer 23A O6 and O7 go from ON to OFF _____
Peer 23B O6 and O7 go from ON to OFF _____

Panelview indicates Reach back to Booster Injection _____

5.7.1.2 Measure resistance terminal 2-4 to 2K2/1
Greater than 100k ohms _____
Measure resistance terminal 2-5 to 2K1/3
Greater than 100k ohms _____
Measure resistance terminal 1-4 to 1K2/1
Greater than100k ohms _____
Measure resistance terminal 1-5 to 1K1/3
Greater than 100k ohms _____

5.7.1.3 Reconnect 5470A/17 and reset reach back via Panelview and restore mode. _____

5.7.1.4 In Building 921 lift wire 5470A18 to lose AGS Injection Off (2) status _____
At Peer 23 Critical Device Box in building 911:
Peer 23A O6 and O7 go from ON to OFF _____
Peer 23B O6 and O7 go from ON to OFF _____

Panelview indicates Reach back to Booster Injection _____

5.7.1.5 Measure resistance terminal 2-4 to 2K2/1
Greater than 100k ohms _____
Measure resistance terminal 2-5 to 2K1/3
Greater than 100k ohms _____
Measure resistance terminal 1-4 to 1K2/1
Greater than100k ohms _____
Measure resistance terminal 1-5 to 1K1/3
Greater than 100k ohms _____

5.7.1.6 Reconnect 5470A/17 and reset reach back via Panelview and restore mode. _____

5.7.2 With Peer23A and 23B in R/A (mode 8) for 2 minutes, confirm that Booster Injection (1) AND BOOSTER Injection (2) are enabled. Confirm that at Booster Injection Critical Device Box in Building 911 Output lamps O6 and O7 are ON for both Division “A” and “B”.

5.7.2.1 In Building 921 lift wire 5470A17 to lose AGS Injection Off (1) status
At Peer 23 Critical Device Box in building 911:
Peer 23A O6 and O7 go from ON to OFF _____
Peer 23B O6 and O7 go from ON to OFF _____

Panelview indicates Reach back to Booster Injection _____

5.7.2.2 Reconnect 5470A/17 and reset reach back via Panelview and restore mode. _____

5.7.2.3 In Building 921 lift wire 5470A18 to lose AGS Injection Off (2) status

At Peer 23 Critical Device Box in building 911:

Peer 23A O6 and O7 go from ON to OFF _____

Peer 23B O6 and O7 go from ON to OFF _____

Panelview indicates Reach back to Booster Injection _____

5.7.2.4 Reconnect 5470A/18 and reset reach back via Panelview and restore mode. _____

5.7.3 With Peer23A and 23B in C/A (mode 16) for 2 minutes, confirm that Booster Injection (1) AND BOOSTER Injection (2) are enabled. Confirm that at Booster Injection Critical Device Box in Building 911 Output lamps O6 and O7 are ON for both Division “A” and “B”.

5.7.3.1 In Building 921 lift wire 5470A17 to lose AGS Injection Off (1) status

At Peer 23 Critical Device Box in building 911:

Peer 23A O6 and O7 go from ON to OFF _____

Peer 23B O6 and O7 go from ON to OFF _____

Panelview indicates Reach back to Booster Injection _____

5.7.3.2 Reconnect 5470A/17 and reset reach back via Panelview and restore mode. _____

5.7.3.3 In Building 921 lift wire 5470A18 to lose AGS Injection Off (2) status

At Peer 23 Critical Device Box in building 911:

Peer 23A O6 and O7 go from ON to OFF _____

Peer 23B O6 and O7 go from ON to OFF _____

Panelview indicates Reach back to Booster Injection _____

5.7.3.4 Reconnect 5470A/18 and reset reach back via Panelview and restore mode. _____

PEER 25 CRITICAL DEVICES - UD1,2 P.S. (UD1,2 AC), UD1,2 440 VAC DISCONNECT (UD1,2 DC), H10 P.S., AGS INJECTION ENABLE (1), AGS INJECTION ENABLE (2)

5.8 UD1,2 P.S., UD1,2 440 VAC DISCONNECT

5.8.1 With Peer 25A and B in NO ACCESS (mode 24) observe after 90 seconds that UD1,2 P.S. and UD1,2 440 VAC DISCONNECT are enabled and Panelview so indicates. Note that 440 VAC DISCONNECT contactor closes after 90 seconds without further command.

5.8.2 At the Critical Device Box in Building 912 near UD1,2 P.S. perform the measurements listed.:

Measure resistance terminal 2-4 to 2K2/1 Less than 2 ohms _____
Measure resistance terminal 2-5 to 2K1/3 Less than 2 ohms _____
Measure resistance terminal 1-4 to 1K2/1 Less than 2 ohms _____
Measure resistance terminal 1-5 to 1K1/3 Less than 2 ohms _____

UD1,2 ENABLE AC indicates : Peer 25A out 7 on _____
UD1,2 ENABLE DC indicates : Peer 25A out 6 on _____
UD1,2 ENABLE AC indicates : Peer 25B out 7 on _____
UD1,2 ENABLE DC indicates : Peer 25B out 6 on_____

UD1,2 STATUS AC indicates: Peer 25A in 7 on _____
UD1,2 STATUS DC indicates: Peer 25A in 6 off _____
UD1,2 STATUS AC indicates: Peer 25B in 7 on _____
UD1,2 STATUS DC indicates: Peer 25B in 6 off _____

Panelview indicates UD1,2 AC and DC enabled by Peer 25 and UD1,2 DC ON _____

5.8.3 Confirm that UD1,2 P.S. can be turned on.

UD1,2 AC STATUS indicates: Peer 25A in7 off _____
UD1,2 AC STATUS indicates: Peer 25B in7 off _____
Panelview indicates UD1,2 AC and DC on _____

5.8.4 Both divisions assure UD1,2 AC and DC disabled for C/A
Set Peer 25A and 25B to C/A (mode 16) and observe UD1,2 Disabled.

Measure resistance terminal 2-4 to 2K2/1
Greater than 100k ohms _____
Measure resistance terminal 2-5 to 2K1/3
Greater than 100k ohms _____

Measure resistance terminal 1-4 to 1K2/1
Greater than100k ohms _____
Measure resistance terminal 1-5 to 1K1/3
Greater than 100k ohms _____

UD1,2 ENABLE AC indicates : Peer 25A out7 off _____
UD1,2 ENABLE DC indicates : Peer 25A out6 off _____
UD1,2 ENABLE AC indicates : Peer 25B out7 off _____
UD1,2 ENABLE DC indicates : Peer 25B out6 off_____

UD1,2 STATUS AC indicates: Peer 25A in7 on _____
UD1,2 STATUS DC indicates: Peer 25A in6 on _____
UD1,2 STATUS AC indicates: Peer 25B in7 on _____
UD1,2 STATUS DC indicates: Peer 25B in6 on _____

5.8.5 Both divisions assure UD1,2 AC and DC disabled for R/A
Set Peer 25A and 25B to R/A (mode 8) and observe UD1,2 Disabled.

UD1,2 ENABLE AC indicates : Peer 25A out7 off _____
UD1,2 ENABLE DC indicates : Peer 25A out6 off _____
UD1,2 ENABLE AC indicates : Peer 25B out7 off _____
UD1,2 ENABLE DC indicates : Peer 25B out6 off_____

UD1,2 STATUS AC indicates: Peer 25A in7 on _____
UD1,2 STATUS DC indicates: Peer 25A in6 on _____
UD1,2 STATUS AC indicates: Peer 25B in7 on _____
UD1,2 STATUS DC indicates: Peer 25B in6 on _____

5.8.6 Both divisions assure UD1,2 AC and DC disabled for SAFE STATE
Set Peer 25A and 25B to SAFE STATE (mode 2) and observe UD1,2 Disabled.

UD1,2 ENABLE AC indicates : Peer 25A out7 off _____
UD1,2 ENABLE DC indicates : Peer 25A out6 off _____
UD1,2 ENABLE AC indicates : Peer 25B out7 off _____
UD1,2 ENABLE DC indicates : Peer 25B out6 off_____

UD1,2 STATUS AC indicates: Peer 25A in7 on _____
UD1,2 STATUS DC indicates: Peer 25A in6 on _____
UD1,2 STATUS AC indicates: Peer 25B in7 on _____
UD1,2 STATUS DC indicates: Peer 25B in6 on _____

5.9 H10 P.S.

5.9.1 With Peer 25A and B in NO ACCESS (mode 24) observe after 90 seconds that H10 P.S. is enabled and Panelview so indicates..

5.9.2 At the Critical Device Box in H10 House near H10 P.S.. perform the measurements listed.:

Measure resistance terminal 1-4 to 1K2/1 Less than 2 ohms _____
Measure resistance terminal 1-5 to 1K1/3 Less than 2 ohms _____

H10 P.S. ENABLE indicates : Peer 25A out7 on _____
H10 P.S. ENABLE indicates : Peer 25B out7 on _____

H10 P.S. STATUS indicates : Peer25A in7 on _____
H10 P.S. STATUS indicates : Peer25B in7 on _____

Panelview indicates H10 P.S. enabled by Peer 25 _____

5.9.3 Confirm that H10 P.S. can be turned on.

H10 P.S. STATUS indicates : Peer25A in7 off _____
H10 P.S. STATUS indicates : Peer25B in7 off _____

Panelview indicates H10 P.S. On _____

5.9.4 Both divisions assure H10 P.S. disabled for C/A
Set Peer 25A and 25B to C/A (mode 16) and observe H10 P.S. Disabled.

Measure resistance terminal 1-4 to 1K2/1
Greater than100k ohms _____
Measure resistance terminal 1-5 to 1K1/3
Greater than 100k ohms _____

H10 P.S. ENABLE indicates: Peer 25A out7 off _____
H10 P.S. ENABLE indicates: Peer 25B out7 off _____

H10 P.S. STATUS indicates: Peer 25A in7 on _____
H10 P.S. STATUS indicates: Peer 25B in7 on _____

5.9.5 Both divisions assure H10 P.S. disabled for R/A
Set Peer 25A and 25B to R/A (mode 8) and observe H10 P.S. Disabled.

Measure resistance terminal 1-4 to 1K2/1
Greater than100k ohms _____
Measure resistance terminal 1-5 to 1K1/3
Greater than 100k ohms _____
H10 P.S. ENABLE indicates : Peer 25A out7 off _____
H10 P.S. ENABLE indicates : Peer 25B out7 off _____

H10 P.S. STATUS indicates: Peer 25A in7 on _____
H10 P.S. STATUS indicates: Peer 25B in7 on _____

5.9.6 Both divisions assure H10 P.S. disabled for SAFE STATE
Set Peer 25A and 25B to SAFE STATE (mode 217) and observe H10 P.S. Disabled.

Measure resistance terminal 1-4 to 1K2/1
Greater than100k ohms _____
Measure resistance terminal 1-5 to 1K1/3
Greater than 100k ohms _____

H10 P.S. ENABLE indicates : Peer 25A out7 off _____
H10 P.S. ENABLE indicates : Peer 25B out7 off _____

H10 P.S. STATUS indicates: Peer 25A in7 on _____
H10 P.S. STATUS indicates: Peer 25B in7 on _____

5.10 AGS INJECTION ENABLE (1) and AGS INJECTION ENABLE (2)
The following test will be done with Peer 3 in SAFE STATE (no reach back to AGS Injection Enable) and Peer 23 in NO ACCESS mode.

5.10.1 Confirm that the Building 921 Critical Device box (5470) is mechanically sound and that the GREEN communication (COM) lamps on the RIO blocks are ON.

5.10.2 In Building 921, with Peer25A and 25B in SAFE STATE (mode 2) for 2 minutes, confirm AGS INJECTION ENABLE (1) and AGS INJECTION ENABLE (2) and Panelview so indicates.

Measure resistance 5470A/13 to K6/9 Less than 2 ohms _____
Measure resistance 5470A/15 to K6/9 Less than 2 ohms _____
Measure resistance 5470A/14 to K11/5 Less than 2 ohms _____
Measure resistance 5470A/16 to K11/5 Less than 2 ohms _____

AGS INJECTION ENABLE (1) indicates : Peer 25A out7 on _____
AGS INJECTION ENABLE (2) indicates : Peer 25A out6 on _____
AGS INJECTION ENABLE (1) indicates : Peer 25B out7 on _____

AGS INJECTION ENABLE (2) indicates : Peer 25B out6 on_____

Assuming AGS Injection is On:

AGS INJECTION STATUS (1) indicates: Peer 25A in7 off _____
AGS INJECTION STATUS (2) indicates: Peer 25A in6 off _____
AGS INJECTION STATUS (1) indicates: Peer 25B in7 off _____
AGS INJECTION STATUS (2) indicates: Peer 25B in6 off _____

Panelview indicates AGS Injection enabled by Peer 25 _____

5.10.3 With Peer25A and 25B in R/A (mode 8) for 2 minutes confirm that AGS Injection is enabled.

AGS INJECTION ENABLE (1) indicates : Peer 25A out7 on _____
AGS INJECTION ENABLE (2) indicates : Peer 25A out6 on _____
AGS INJECTION ENABLE (1) indicates : Peer 25B out7 on _____
AGS INJECTION ENABLE (2) indicates : Peer 25B out6 on_____

Panelview indicates AGS Injection enabled by Peer 25 _____

5.10.4 With Peer25A and 25B in C/A (mode 16) for 2 minutes confirm that AGS Injection is enabled.

AGS INJECTION ENABLE (1) indicates : Peer 25A out7 on _____
AGS INJECTION ENABLE (2) indicates : Peer 25A out6 on _____
AGS INJECTION ENABLE (1) indicates : Peer 25B out7 on _____
AGS INJECTION ENABLE (2) indicates : Peer 25B out6 on_____

Panelview indicates AGS Injection enabled by Peer 25 _____

5.11 Test that incorrect status of UD1,2 AC, UD1,2 DC or H10 P.S. reaches back to interlock AGS Injection (1) and AGS Injection (2) for Peer 25 in SAFE STATE (mode 2).

5.11.1 With Peer 25A and Peer 25B in SAFE STATE (mode 2) for 2 minutes, confirm that AGS INJECTION (1) AND AGS INJECTION (2) are enabled. Confirm that Building 921 Critical Device Box (5470) Peer 25 RIO Output lamps O6 and O7 lamps are On for both Division “A” and “B”.

Peer 25A O6 is On _____
Peer 25A O7 is On _____
Peer 25B O6 is On _____
Peer 25B O7 is On _____

5.11.1.1 In UD1,2 Critical Device Box lift wire 1-3 to lose UD1,2 AC Off status.
At 5470 box in building 921:
Peer 25A O6 and O7 go from ON to OFF _____
Peer 25B O6 and O7 go from ON to OFF _____

Panelview indicates Reach back to AGS Injection _____

5.11.1.2 Measure resistance 5470A/13 to K6/9
Greater than 100k ohms _____
Measure resistance 5470A/15 to K6/9
Greater than 100k ohms _____
Measure resistance 5470A/14 to K11/5
Greater than 100k ohms _____
Measure resistance 5470A/16 to K11/5
Greater than 100k ohms _____

5.11.1.3 Reconnect 1-3 in UD1,2 Box and reset reach back via Panelview and restore mode _____

5.11.1.4 In UD1,2 Critical Device Box lift wire 2-3 to lose UD1,2 DC Off status.
At 5470 box in building 921:
Peer 25A O6 and O7 go from ON to OFF _____
Peer 25B O6 and O7 go from ON to OFF _____

Panelview indicates Reach back to AGS Injection _____

5.11.1.5 Measure resistance 5470A/13 to K6/9
Greater than 100k ohms _____
Measure resistance 5470A/15 to K6/9
Greater than 100k ohms _____
Measure resistance 5470A/14 to K11/5
Greater than 100k ohms _____
Measure resistance 5470A/16 to K11/5
Greater than 100k ohms _____

5.11.1.6 Reconnect 2-3 in UD1,2 Box and reset reach back via Panelview and restore mode _____

5.11.1.7 In H10 Critical Device Box lift wire 1-3 to lose H10 Off status.
At 5470 box in building 921:
Peer 25A O6 and O7 go from ON to OFF _____
Peer 25B O6 and O7 go from ON to OFF _____

Panelview indicates Reach back to AGS Injection _____

5.12 Test that incorrect status of UD1,2 AC, UD1,2 DC or H10 P.S. reaches back to interlock AGS Injection (1) and AGS Injection (2) for Peer 25 in R/A (mode 8).

5.12.1 With Peer 25A and Peer 25B in R/A (mode 8) for 2 minutes, confirm that AGS INJECTION (1) AND AGS INJECTION (2) are enabled. Confirm that Building 921 Critical Device Box (5470) Peer 25 RIO Output lamps O6 and O7 lamps are On for both Division "A" and "B".

Peer 25A O6 is On _____
Peer 25A O7 is On _____
Peer 25B O6 is On _____
Peer 25B O7 is On _____

5.12.1.1 In UD1,2 Critical Device Box lift wire 1-3 to lose UD1,2 AC Off status.
At 5470 box in building 921:
Peer 25A O6 and O7 go from ON to OFF _____
Peer 25B O6 and O7 go from ON to OFF _____

Panelview indicates Reach back to AGS Injection _____

5.12.1.2 Measure resistance 5470A/13 to K6/9
Greater than 100k ohms _____
Measure resistance 5470A/15 to K6/9
Greater than 100k ohms _____
Measure resistance 5470A/14 to K11/5
Greater than 100k ohms _____
Measure resistance 5470A/16 to K11/5
Greater than 100k ohms _____

5.12.1.3 Reconnect 1-3 in UD1,2 Box and reset reach back via Panelview and restore mode _____

5.12.1.4 In UD1,2 Critical Device Box lift wire 2-3 to lose UD1,2 DC Off status.
At 5470 box in building 921:
Peer 25A O6 and O7 go from ON to OFF _____
Peer 25B O6 and O7 go from ON to OFF _____

Panelview indicates Reach back to AGS Injection _____

5.12.1.5 Measure resistance 5470A/13 to K6/9
Greater than 100k ohms _____
Measure resistance 5470A/15 to K6/9

Greater than 100k ohms _____
Measure resistance 5470A/14 to K11/5
Greater than 100k ohms _____
Measure resistance 5470A/16 to K11/5
Greater than 100k ohms _____

5.12.1.6 Reconnect 2-3 in UD1,2 Box and reset reach back via Panelview and restore mode _____

5.12.1.7 In H10 Critical Device Box lift wire 1-3 to lose H10 Off status.
At 5470 box in building 921:
Peer 25A O6 and O7 go from ON to OFF _____
Peer 25B O6 and O7 go from ON to OFF _____

Panelview indicates Reach back to AGS Injection _____

5.12.1.8 Measure resistance 5470A/13 to K6/9
Greater than 100k ohms _____
Measure resistance 5470A/15 to K6/9
Greater than 100k ohms _____
Measure resistance 5470A/14 to K11/5
Greater than 100k ohms _____
Measure resistance 5470A/16 to K11/5
Greater than 100k ohms _____

5.12.1.9 Reconnect 1-3 in H10 Box and reset reach back via Panelview and restore mode _____

5.13 Test that incorrect status of UD1,2 AC, UD1,2 DC or H10 P.S. reaches back to interlock AGS Injection (1) and AGS Injection (2) for Peer 25 in C/A (mode 16).

5.13.1 With Peer 25A and Peer 25B in C/A (mode 16) for 2 minutes, confirm that AGS INJECTION (1) AND AGS INJECTION (2) are enabled. Confirm that Building 921 Critical Device Box (5470) Peer 25 RIO Output lamps O6 and O7 lamps are On for both Division “A” and “B”.

Peer 25A O6 is On _____
Peer 25A O7 is On _____
Peer 25B O6 is On _____
Peer 25B O7 is On _____

5.13.1.1 In UD1,2 Critical Device Box lift wire 1-3 to lose UD1,2 AC Off status.

At 5470 box in building 921:
Peer 25A O6 and O7 go from ON to OFF _____
Peer 25B O6 and O7 go from ON to OFF _____

Panelview indicates Reach back to AGS Injection _____

5.13.1.2 Measure resistance 5470A/13 to K6/9
Greater than 100k ohms _____
Measure resistance 5470A/15 to K6/9
Greater than 100k ohms _____
Measure resistance 5470A/14 to K11/5
Greater than 100k ohms _____
Measure resistance 5470A/16 to K11/5
Greater than 100k ohms _____

5.13.1.3 Reconnect 1-3 in UD1,2 Box and reset reach back via Panelview and restore mode _____

5.13.1.4 In UD1,2 Critical Device Box lift wire 2-3 to lose UD1,2 DC Off status.
At 5470 box in building 921:
Peer 25A O6 and O7 go from ON to OFF _____
Peer 25B O6 and O7 go from ON to OFF _____

Panelview indicates Reach back to AGS Injection _____

5.13.1.5 Measure resistance 5470A/13 to K6/9
Greater than 100k ohms _____
Measure resistance 5470A/15 to K6/9
Greater than 100k ohms _____
Measure resistance 5470A/14 to K11/5
Greater than 100k ohms _____
Measure resistance 5470A/16 to K11/5
Greater than 100k ohms _____

5.13.1.6 Reconnect 2-3 in UD1,2 Box and reset reach back via Panelview and restore mode _____

5.13.1.7 In H10 Critical Device Box lift wire 1-3 to lose H10 Off status.
At 5470 box in building 921:
Peer 25A O6 and O7 go from ON to OFF _____
Peer 25B O6 and O7 go from ON to OFF _____

Panelview indicates Reach back to AGS Injection _____

5.13.1.8 Measure resistance 5470A/13 to K6/9
Greater than 100k ohms _____
Measure resistance 5470A/15 to K6/9
Greater than 100k ohms _____
Measure resistance 5470A/14 to K11/5
Greater than 100k ohms _____
Measure resistance 5470A/16 to K11/5
Greater than 100k ohms _____

5.13.1.9 Reconnect 1-3 in H10 Box and reset reach back via Panelview and restore mode _____

6. Documentation

6.1 This Procedure completed.

6.2 Completed PASS System Trouble Logbook

6.3 Completed PASS System Release History Logbook

7. References

7.1 AGS OPM 9.1.16, “Lockout/Tagout for Radiation Safety (RS LOTO)”

8. Attachments